PROJECT NO.: VA245-P-0622 Task #3 — BUILDING: 320 — SYSTEM: BOILER BFT3 — PAGE: 3

Column headings — SYSTEM OUTPUTS: BINARY (ELECTRIC DEVICE, START/STOP, OPEN/CLOSE); ANALOG (SPEED COMMAND, VALVE POSITION, DAMPER POSITION). SYSTEM INPUTS: BINARY (STATUS, ALARM, PRESSURE, HIGH HUMIDITY, HIGH STATIC PRESSURE, LOW TEMPERATURE); ANALOG (TEMPERATURE (TI), PRESSURE, POSITION, FLOW, PERCENT OF LOAD, STATIC PRESSURE, CARBON MONOXIDE, FIRING RATE, HERTZ, PARTS PER MILLION, VOLTAGE). SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING (HIGH LIMIT, LOW LIMIT, STATUS); APPLICATION/FUNCTION (SCHEDULE START/STOP, FUNCTION, DUTY CYCLE, TEMPERATURE ECONOMIZER, ENTHALPY ECOMONIZER, TEMPERATURE RESET, DEMAND LIMITING, TEMPERATURE OVERRIDE, STATIC PRESSURE RESET, PRESSURE/VOLUME CONTROL, FAILURE MODE, SPACE TEMPERATURE CONTROL, FULL COMMUNICATION, TRENDING, GRAPHICS). REMARKS.

SYSTEM COMPONENT:	Points marked	REMARKS
STATUS	Input binary STATUS; TRENDING; GRAPHICS	
BURNER	FIRING RATE; TRENDING; GRAPHICS	
FORCED DRAFT FAN	DAMPER POSITION; Input binary STATUS; Alarm STATUS; TRENDING; GRAPHICS	
DIFFERENTIAL PRESSURE	Input binary PRESSURE; Alarm STATUS; TRENDING; GRAPHICS	
VARIABLE FREQUENCY DRIVE (VFD)	HERTZ; Alarm STATUS; TRENDING; GRAPHICS	
VFD FAULT	Input binary STATUS; Alarm STATUS; GRAPHICS	
VOLTAGE A to B	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
VOLTAGE B to C	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
VOLTAGE C to A	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
VOLTAGE A to N	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
VOLTAGE B to N	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
VOLTAGE C to N	VOLTAGE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
COMBUSTION AIR		
OUTSIDE AIR DAMPER	OPEN/CLOSE; GRAPHICS	
OUTSIDE AIR DAMPER - OPEN	Input binary STATUS; Alarm STATUS; GRAPHICS	
FILTER	HIGH STATIC PRESSURE; HIGH LIMIT; Alarm STATUS; GRAPHICS	
STEAM CONTROL VALVE	VALVE POSITION; GRAPHICS	
SUPPLY AIR TEMPERATURE	TEMPERATURE (TI); HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
BOILER STEAM PRESSURE	TEMPERATURE (TI); Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
BOILER STEAM FLOW (SFM3)	FLOW; PERCENT OF LOAD; TRENDING; GRAPHICS	
BOILER STACK TEMPERATURE	TEMPERATURE (TI); TRENDING; GRAPHICS	
LEAVING ECONOMIZER TEMPERATURE	TEMPERATURE (TI); TRENDING; GRAPHICS	
ECONOMIZER ENTERING WATER TEMP.	TEMPERATURE (TI); Analog PRESSURE; TRENDING; GRAPHICS	
ECONOMIZER LEAVING WATER TEMP.	TEMPERATURE (TI); Analog PRESSURE; TRENDING; GRAPHICS	
ECONOMIZER AIR DELTA TEMP.	GRAPHICS	Calculated
ECONOMIZER WATER DELTA TEMP.	GRAPHICS	Calculated
FLUE GAS RECIRCULATION		
FLOW	FLOW	
DAMPER POSITION	VALVE POSITION; Alarm STATUS	
AIR COMPRESSOR (integral)	START/STOP; Input binary STATUS; Analog PRESSURE; LOW LIMIT; Alarm STATUS; TRENDING; GRAPHICS	
FUEL PUMP (integral)	START/STOP; Input binary STATUS; Analog PRESSURE; LOW LIMIT; Alarm STATUS; TRENDING; GRAPHICS	
ECONOMIZER STACK DAMPER	DAMPER POSITION; TRENDING; GRAPHICS	
OXYGEN	PERCENT OF LOAD; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
NOX	PARTS PER MILLION; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
CARBON MONOXIDE	PARTS PER MILLION; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
EXCESS AIR	PERCENT OF LOAD; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
WATER LEVEL	POSITION; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
AUXILLIARY WATER LEVEL	POSITION; LOW LIMIT; TRENDING; GRAPHICS	
BLOWDOWN CONTROL VALVE CV-11	VALVE POSITION; POSITION; TRENDING; GRAPHICS	
BOILER NATURAL GAS FLOW (NGFM3)	FLOW; TRENDING; GRAPHICS	
BOILER FUEL OIL FLOW (DFM5)	FLOW; TRENDING; GRAPHICS	
BOILER 2-WAY FUEL OIL VALVE	VALVE POSITION; POSITION; TRENDING; GRAPHICS	
BOILER 3-WAY FUEL OIL VALVE	VALVE POSITION; POSITION; TRENDING; GRAPHICS	
LP GAS IGNITER PILOT (in use)	Input binary STATUS; Alarm STATUS	
PRESSURE	Input binary PRESSURE; Alarm STATUS	
STATUS - First out alarm annunciation for each of the following interlocks:		First out alarm annunciation.
FLAME FAILURE	ALARM; Alarm STATUS; GRAPHICS	
PURGE AIRFLOW LOW	ALARM; Alarm STATUS; GRAPHICS	
COMBUSTION AIRFLOW LOW	ALARM; Alarm STATUS; GRAPHICS	
FALSE COMBUSTION AIR	ALARM; Alarm STATUS; GRAPHICS	
HIGH MAIN GAS PRESSURE (at gas train)	ALARM; Alarm STATUS; GRAPHICS	
LOW MAIN GAS PRESSURE (at gas train)	ALARM; Alarm STATUS; GRAPHICS	
HIGH OIL PRESSURE (at fuel train)	ALARM; Alarm STATUS; GRAPHICS	
LOW OIL PRESSURE (at fuel train)	ALARM; Alarm STATUS; GRAPHICS	
LOW IGNITER (PILOT) GAS PRESSURE	ALARM; Alarm STATUS; GRAPHICS	
FUEL SAFETY SHUTOFF VALVES NOT CLOSED PRIOR TO IGNITION CYCLE	ALARM; Alarm STATUS; GRAPHICS	
LOW FIRE POSITION NOT ATTAINED PRIOR TO IGNITION CYCLE	ALARM; Alarm STATUS; GRAPHICS	
LOW ATOMIZING MEDIA STATIC PRESSURE AT ATOMIZING MEDIA	ALARM; Alarm STATUS; GRAPHICS	
SERVICE CONNECTION TO BURNER PIPING		
LOW ATOMIZING OIL DIFFERENTIAL PRESSURE	ALARM; Alarm STATUS; GRAPHICS	
LOW WATER CUTOFF	ALARM; Alarm STATUS; GRAPHICS	
LOW ATOMIZING AIR PRESSURE	ALARM; Alarm STATUS; GRAPHICS	
FLUE GAS RECIRCULATION IMPROPER DAMPER POSITION	ALARM; Alarm STATUS; GRAPHICS	
LOW FLUE GAS OXYGEN	ALARM; Alarm STATUS; GRAPHICS	
Alarm annunciation, safety shutdown and manual reset required for:		Provide alarm annunciation, safety shutdow n and manual reset.
FLAME SIGNAL DETECTED PRIOR TO IGNITION CYCLE	ALARM; Alarm STATUS; GRAPHICS	
PRE-IGNITION INTERLOCK OPEN DURING PRE-PURGE	ALARM; Alarm STATUS; GRAPHICS	
HIGH FIRE PURGE INTERLOCK FAILS TO CLOSE	ALARM; Alarm STATUS; GRAPHICS	
LOW FIRE PURGE INTERLOCK FAILS TO CLOSE	ALARM; Alarm STATUS; GRAPHICS	
IGNITER (PILOT) FAILS TO IGNITE	ALARM; Alarm STATUS; GRAPHICS	
MAIN BURNER FAILS TO IGNITE	ALARM; Alarm STATUS; GRAPHICS	
MALFUNCTION OF FLAME DETECTOR	ALARM; Alarm STATUS; GRAPHICS	
MALFUNCTION OF PROGRAMMER	ALARM; Alarm STATUS; GRAPHICS	
MALFUNCTION OF FLAME SIGNAL AMPLIFIER	ALARM; Alarm STATUS; GRAPHICS	
COMBUSTION AIR PROVING SWITCH ACTUATED PRIOR TO	ALARM; Alarm STATUS; GRAPHICS	
START-UP OF FORCED DRAFT FAN		
LOCK-OUT INTERLOCK OPEN DURING PRE-PURGE	ALARM; Alarm STATUS; GRAPHICS	
LOCK-OUT INTERLOCK OPEN DURING IGNITION	ALARM; Alarm STATUS; GRAPHICS	
LOCK-OUT INTERLOCK OPEN DURING RUN PERIOD	ALARM; Alarm STATUS; GRAPHICS	
INTERLOCK OPEN	ALARM; Alarm STATUS; GRAPHICS	
FLAME FAILURE	ALARM; Alarm STATUS; GRAPHICS	

1 POINTS LIST FOR BOILER BFT3
NTS

PROJECT NO.: VA245-P-0622 Task #3 — BUILDING: 320 — SYSTEM: BOILER PLANT MISCELLANEOUS AND STEAM FLOWS — PAGE: 4

Column headings — SYSTEM OUTPUTS: BINARY (ELECTRIC DEVICE, START/STOP, OPEN/CLOSE); ANALOG (SPEED COMMAND, VALVE POSITION, DAMPER POSITION). SYSTEM INPUTS: BINARY (STATUS, ALARM, PRESSURE, HIGH HUMIDITY, HIGH STATIC PRESSURE, LOW TEMPERATURE); ANALOG (TEMPERATURE (TI), PRESSURE, POSITION, FLOW, PERCENT, STATIC PRESSURE, CARBON MONOXIDE (PPM), HUMIDITY, PARTS PER MILLION). SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING (LOCAL ALARM PANEL, AREA ALARM PANEL, MASTER ALARM PANEL, HIGH LIMIT, LOW LIMIT, STATUS); APPLICATION/FUNCTION (SCHEDULE START/STOP, FUNCTION, DUTY CYCLE, TEMPERATURE ECONOMIZER, ENTHALPY ECOMONIZER, TEMPERATURE RESET, DEMAND LIMITING, TEMPERATURE OVERRIDE, STATIC PRESSURE RESET, PRESSURE/VOLUME CONTROL, FAILURE MODE, SPACE TEMPERATURE CONTROL, FULL COMMUNICATION, TRENDING, GRAPHICS). REMARKS.

SYSTEM COMPONENT:	Points marked	REMARKS
EMERGENCY STOP	Input binary STATUS; Alarm STATUS	
MAIN STEAM HEADER PRESSURE	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
MAIN STEAM HEADER TEMPERATURE	TEMPERATURE (TI); TRENDING; GRAPHICS	
TOTAL PLANT STEAM FLOW (calculated)	FLOW; PERCENT	
HOSPITAL STEAM FLOW (SFM7)	FLOW; TRENDING; GRAPHICS	
OUT BUILDING STEAM FLOW (campus) (SFM4)	FLOW; TRENDING; GRAPHICS	
IN-HOUSE STEAM FLOW (SFM5)	FLOW; TRENDING; GRAPHICS	
RO HEAT EXCHANGER FLOW (SFM6)	FLOW; TRENDING; GRAPHICS	
CAMPUS CONDENSATE RETURN FLOW (WFM1)	FLOW; TRENDING; GRAPHICS	
PRESSURE REDUCING STATION		
downstream pressure		
HEAT EXCHANGERS HX1 & HX2 PRV-1 & PRV-2	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
RO HEAT EXCHANGER PRV-3 & PRV-4	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
DEAREATOR & STORAGE TANK PRV-5 & PRV-6	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
DDC CONTROL VALVE (PRV-5)	VALVE POSITION; POSITION; TRENDING; GRAPHICS	
DDC CONTROL VALVE (PRV-6)	VALVE POSITION; POSITION; TRENDING; GRAPHICS	
40 PSIG CAMPUS PRV-7 & PRV-8	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
BOILER PLANT IN-HOUSE PRV-9	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
BURNER MANAGEMENT SAFETY		
CONTROL SYSTEM - ALARM	ALARM; Alarm STATUS	
STEAM TRAP MONITORING SYSTEM	Input binary STATUS; Alarm STATUS	
BUILDING 320 CARBON MONOXIDE LEVEL	CARBON MONOXIDE (PPM); HIGH LIMIT; Alarm STATUS; TRENDING; GRAPHICS	
OUTSIDE AIR TEMPERATURE	TEMPERATURE (TI); TRENDING; GRAPHICS	
OUTSIDE AIR TEMPERATURE	TEMPERATURE (TI); TRENDING; GRAPHICS	

2 POINTS LIST FOR BOILER PLANT
NTS

PROJECT NO.: VA245-P-0622 Task #3 — BUILDING: 320 — SYSTEM: FUEL SYSTEMS — PAGE: 7

Column headings — SYSTEM OUTPUTS: BINARY (ELECTRIC DEVICE, START/STOP, OPEN/CLOSE); ANALOG (SPEED COMMAND, VALVE POSITION, DAMPER POSITION). SYSTEM INPUTS: BINARY (STATUS, ALARM, PRESSURE, HIGH HUMIDITY, HIGH STATIC PRESSURE, LOW TEMPERATURE, CURRENT SENSING RELAY); ANALOG (TEMPERATURE (TI), PRESSURE, POSITION, FLOW, PERCENT, STATIC PRESSURE, CARBON MONOXIDE, HUMIDITY, MOD BUS CONNECTION). SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING (HIGH LIMIT, LOW LIMIT, STATUS); APPLICATION/FUNCTION (SCHEDULE START/STOP, FUNCTION, DUTY CYCLE, TEMPERATURE ECONOMIZER, ENTHALPY ECOMONIZER, TEMPERATURE RESET, DEMAND LIMITING, TEMPERATURE OVERRIDE, STATIC PRESSURE RESET, PRESSURE/VOLUME CONTROL, FAILURE MODE, SPACE TEMPERATURE CONTROL, FULL COMMUNICATION, TRENDING, GRAPHICS). REMARKS.

SYSTEM COMPONENT:	Points marked	REMARKS
FUEL OIL TRANSFER PUMPS		
PUMP #1	START/STOP; Input binary STATUS; Alarm STATUS; TRENDING; GRAPHICS	
PUMP #2	START/STOP; Input binary STATUS; Alarm STATUS; TRENDING; GRAPHICS	
TANK MONITORING		
TANK #1 - FUEL LEVEL	POSITION; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
TANK #1 - HIGH LEVEL	Input binary STATUS; HIGH LIMIT; GRAPHICS	
TANK #1 - LOW LEVEL	Input binary STATUS; LOW LIMIT; GRAPHICS	
TANK #2 - FUEL LEVEL	POSITION; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
TANK #2 - HIGH LEVEL	Input binary STATUS; HIGH LIMIT; GRAPHICS	
TANK #2 - LOW LEVEL	Input binary STATUS; LOW LIMIT; GRAPHICS	
TANK FLUID LEVEL MONITORING & ALARM SYSTEM	Input binary STATUS; MOD BUS CONNECTION; Alarm STATUS; GRAPHICS	
UNDERGROUND FUEL OIL PIPING - INTERSTITIAL		
MONITORING LEAK DETECTION SYSTEM	Input binary STATUS; MOD BUS CONNECTION; Alarm STATUS; GRAPHICS	
NATURAL GAS SERVICE		
MAIN HEADER PRESSURE	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
MAIN HEADER FLOW	FLOW; TRENDING; GRAPHICS	
EMERGENCY NATURAL GAS VALVE	ALARM; Alarm STATUS; GRAPHICS	
FUEL OIL		
PLANT SUPPLY FLOW (OFM1)	Analog PRESSURE; HIGH LIMIT; LOW LIMIT; TRENDING; GRAPHICS	
PLANT RETURN FLOW (OFM2)	FLOW; TRENDING; GRAPHICS	
LP GAS IGNITER PILOT	Input binary STATUS; Alarm STATUS	

3 POINTS LIST FOR FUEL SYSTEMS
NTS

CONSULTANTS:

Barton Associates Consulting Engineers
Susquehanna Commerce Center, North Building, 221 West Philadelphia Street, York, PA 17401
Tel.: (717) 845-7654 Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	RGG	JRA	DJB

Revisions: | Date

DAVID BARTO REGISTERED 19895 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150, York, PA 17404
T 717.843.3200 F 717.699.0205 www.saaarchitects.com

Drawing Title: CONTROL POINTS LISTS - MECHANICAL
Approved: Project Director
Project Title: BOILER PLANT UPGRADE PHASE V
Location: VAMC MARTINSBURG, WV
Date: 10.22.2013 | Checked | Drawn
Project Number: 613-12-501
Building Number: 320
Drawing Number: 320-MP507
Dwg. 38 of 44

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

PROJECT NO.: VA245-P-0622 Task #3	SYSTEM OUTPUTS							SYSTEM INPUTS												SYSTEM SOFTWARE/CONTROL																				PAGE: 5
BUILDING: 320	BINARY			ANALOG				BINARY					ANALOG							ALARM PROCESSING				APPLICATION/FUNCTION																	
SYSTEM: BOILER PLANT AUXILIARIES	ELECTRIC DEVICE	START/STOP	OPEN/CLOSE	SPEED COMMAND	VALVE POSITION	DAMPER POSITION	STATUS	ALARM	PRESSURE	HIGH HUMIDITY	HIGH STATIC PRESSURE	LOW TEMPERATURE	TEMPERATURE (TI)	PRESSURE	POSITION	FLOW	PERCENT	STATIC PRESSURE	CARBON MONOXIDE	HUMIDITY	HERTZ	HIGH LIMIT	LOW LIMIT	STATUS	SCHEDULE START/STOP	FUNCTION	DUTY CYCLE	TEMPERATURE ECONOMIZER	ENTHALPY ECOMONIZER	TEMPERATURE RESET	DEMAND LIMITING	TEMPERATURE OVERRIDE	STATIC PRESSURE RESET	PRESSURE/VOLUME CONTROL	FAILURE MODE	SPACE TEMPERATURE CONTROL	FULL COMMUNICATION	TRENDING	GRAPHICS	REMARKS
SYSTEM COMPONENT:																																								
BOILER FEED PUMP (320-P3)	■					■																																		
PUMP DISCHARGE PRESSURE									■														■																	
VARIABLE FREQUENCY DRIVE (VFD)					■																■		■																	
VFD FAULT						■																		■																
BOILER #1 - FEED WATER FLOW (WFM2)											■						■						■																	
BOILER #1 - FEED WATER PRESSURE									■														■																	
BOILER #1 - FEED WATER CONTROL VALVE CV-6					■				■														■																	
BOILER FEED PUMP (320-P4)	■					■																		■																	
PUMP DISCHARGE PRESSURE									■														■																	
VARIABLE FREQUENCY DRIVE (VFD)					■																■		■																	
VFD FAULT						■																		■																	
BOILER #2 - FEED WATER FLOW (WFM3)											■						■						■																	
BOILER #2 - FEED WATER PRESSURE									■														■																	
BOILER #2 - FEED WATER CONTROL VALVE CV-7					■				■														■																	
BOILER FEED PUMP (320-P5)	■					■																		■																	
PUMP DISCHARGE PRESSURE									■														■																	
VARIABLE FREQUENCY DRIVE (VFD)					■																■		■																	
VFD FAULT						■																		■																	
BOILER #3 - FEED WATER FLOW (WFM4)											■						■						■																	
BOILER #3 - FEED WATER PRESSURE									■														■																	
BOILER #3 - FEED WATER CONTROL VALVE CV-8					■				■														■																	
FEEDWATER DEAERATOR																																								
TANK TEMPERATURE													■																												
TANK WATER LEVEL									■																																
TANK HIGH WATER LEVEL						■																		■																	
TANK LOW WATER LEVEL																								■																	
STEAM CONTROL VALVE CV-12					■																																			
STEAM CONTROL VALVE CV-13						■																																		
OVERFLOW CONTROL VALVE CV-5					■																																			
CONDENSATE TRANSFER CONTROL VALVE CV-4						■																																		
EMERGENCY MAKE-UP CONTROL VALVE CV-3					■																																			
EMERGENCY MAKE-UP FLOW (WFM7)						■																																		
CONDENSATE STORAGE TANK																																								
TANK TEMPERATURE													■																												
SPARGE TUBE STEAM CONTROL VALVE CV-14					■																																			
SPARGE TUBE STEAM CONTROL VALVE CV-15						■																																		
TANK WATER LEVEL									■																																
TANK HIGH WATER LEVEL						■																		■																	
TANK LOW WATER LEVEL																								■																	
PUMP 320-P6	■																																								
PUMP 320-P7						■																		■																	
PUMP 320-P4 DISCHARGE PRESSURE							■																																		
PUMP 320-P5 DISCHARGE PRESSURE																								■																	
NORMAL MAKE-UP CONTROL VALVE CV-1					■																																			
EMERGENCY MAKE-UP CONTROL VALVE CV-2						■																																		
CONTROL VALVE TO SANITARY TCV-2					■																																			
EMERGENCY MAKE-UP FLOW (WFM6)						■																		■																	

1 POINTS LIST FOR BOILER PLANT AUXILIARIES
NTS

PROJECT NO.: VA245-P-0622 Task #3	SYSTEM OUTPUTS							SYSTEM INPUTS												SYSTEM SOFTWARE/CONTROL																				PAGE: 6
BUILDING: 320	BINARY			ANALOG				BINARY					ANALOG							ALARM PROCESSING				APPLICATION/FUNCTION																	
SYSTEM: BOILER PLANT AUXILIARIES	ELECTRIC DEVICE	START/STOP	OPEN/CLOSE	SPEED COMMAND	VALVE POSITION	DAMPER POSITION	STATUS	ALARM	PRESSURE	HIGH HUMIDITY	HIGH STATIC PRESSURE	LOW TEMPERATURE	TEMPERATURE (TI)	PRESSURE	POSITION	FLOW	PERCENT	STATIC PRESSURE	CARBON MONOXIDE	HUMIDITY	MODBUS CONNECTION	HIGH LIMIT	LOW LIMIT	STATUS	SCHEDULE START/STOP	FUNCTION	DUTY CYCLE	TEMPERATURE ECONOMIZER	ENTHALPY ECOMONIZER	TEMPERATURE RESET	DEMAND LIMITING	TEMPERATURE OVERRIDE	STATIC PRESSURE RESET	PRESSURE/VOLUME CONTROL	FAILURE MODE	SPACE TEMPERATURE CONTROL	FULL COMMUNICATION	TRENDING	GRAPHICS	REMARKS
SYSTEM COMPONENT:																																								
BLOWDOWN TANK																																								
TANK TEMPERATURE													■										■																	
TANK WATER LEVEL																							■	■																
CONTROL VALVE TO SANITARY TCV-1					■																																			
DISCHARGE TEMP. TO SANITARY													■																												
BLOWDOWN HEAT EXCHANGER																																								
ENTERING BLOWDOWN WATER TEMPERATURE													■																												
LEAVING BLOWDOWN WATER TEMPERATURE																																								
MAKEUP ENTERING WATER TEMPERATURE													■																												
MAKEUP LEAVING WATER TEMPERATURE																																								
CONTROL VALVE TO SANITARY TCV-3					■																																			
SOFTENED WATER FLOW																■																									
WATER SOFTENER (PHASE 4)																					■																				
HOUSE AIR COMPRESSOR								■						■									■	■																	
AIR DRYER																								■																
REVERSE OSMOSIS SYSTEM (PHASE 4)																					■																				
INCOMING WATER PRESSURE														■										■																
INCOMING WATER TEMPERATURE														■																											
CARBON WATER FILTER #1																								■																
RO UNIT								■																■																
TANK WATER LEVEL															■																									
TANK HIGH WATER LEVEL #1																								■																
TANK HIGH WATER LEVEL #2															■																									
TANK LOW WATER LEVEL																								■																
CIRCULATION PUMP															■																									
CIRCULATION PUMP								■																■																
OUTGOING WATER FLOW (WFM5)																■																									
CONDENSATE POLISHING SYSTEM																																								
PUMP 320-P8	■														■									■																
PUMP 320-P9																																								
CONTROL PANEL															■																									
BOOSTER PUMP 320-BP1															■									■																

2 POINTS LIST FOR BOILER PLANT AUXILIARIES CON'T
NTS

PROJECT NO.: VA245-P-0622 Task #3	SYSTEM OUTPUTS							SYSTEM INPUTS												SYSTEM SOFTWARE/CONTROL																				PAGE: 8
BUILDING: 320	BINARY			ANALOG				BINARY					ANALOG							ALARM PROCESSING				APPLICATION/FUNCTION																	
SYSTEM: BOILER PLANT PHASE 4 EQUIPMENT	ELECTRIC DEVICE	START/STOP	OPEN/CLOSE	SPEED COMMAND	VALVE POSITION	DAMPER POSITION	STATUS	ALARM	PRESSURE	HIGH HUMIDITY	HIGH STATIC PRESSURE	LOW TEMPERATURE	TEMPERATURE (TI)	PRESSURE	POSITION	FLOW	PERCENT	STATIC PRESSURE	CARBON MONOXIDE	HUMIDITY	VACUUM	LOCAL ALARM PANEL	AREA ALARM PANEL	MASTER ALARM PANEL	HIGH LIMIT	LOW LIMIT	STATUS	SCHEDULE START/STOP	FUNCTION	DUTY CYCLE	TEMPERATURE ECONOMIZER	ENTHALPY ECOMONIZER	TEMPERATURE RESET	DEMAND LIMITING	TEMPERATURE OVERRIDE	STATIC PRESSURE RESET	PRESSURE/VOLUME CONTROL	FAILURE MODE	SPACE TEMPERATURE CONTROL	FULL COMMUNICATION	TRENDING	GRAPHICS	REMARKS
SYSTEM COMPONENT:																																								
HEAT EXCHANGER 320-SWH02																																								
STEAM CONTROL VALVE - 1/3					■																																			
STEAM CONTROL VALVE - 2/3																																								
SOFTENED WATER SUPPLY													■											■	■															
ENTERING SOFTENED WATER																																								
HEAT EXCHANGER 320-SWH03																																								
STEAM CONTROL VALVE - 1/3					■																																			
STEAM CONTROL VALVE - 2/3																																								
RO WATER SUPPLY													■											■	■															
ENTERING RO WATER																																								
EXHAUST FAN 320-EF1	■					■																			■		■													
EXHAUST FAN 320-EF6																																								
VENTILATION FAN 320-EF3	■					■																			■													
SPACE TEMPERATURE													■																											
SUMMER/WINTER SWITCH						■																																		
VENTILATION FAN 320-EF4	■					■																			■													
SPACE TEMPERATURE													■																											
SUMMER/WINTER SWITCH						■																																		
VENTILATION FAN 320-EF5	■					■																			■													
SPACE TEMPERATURE													■																											
SUMMER/WINTER SWITCH						■																																		
WALL LOUVERS WITH MOD'S		■										■																												
(11 TOTAL)																																								
CLERESTORY LOUVERS																																								
SPACE TEMPERATURE													■																											
SUMMER/WINTER SWITCH						■																																		
MOD'S WITH LOUVERS		■										■																												
(8 TOTAL)																																								

3 POINTS LIST PHASE IV EQUIPMENT
NTS

Revisions:	Date

CONSULTANTS:

BartonAssociates. Consulting Engineers
Susquehanna Commerce Center, North Building, 221 West Philadelphia Street, York, PA 17401
Tel.: (717) 845-7654 Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	RGG	JRA	DJB

DAVID BARTO REGISTERED 10805 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

SAAarchitects
600 North Hartley Street, Suite 150, York, PA 17404
T 717.843.3200 F 717.699.0205 www.saaarchitects.com

Drawing Title: CONTROL POINTS LISTS - MECHANICAL
Approved: Project Director
Project Title: BOILER PLANT UPGRADE PHASE V
Location: VAMC MARTINSBURG, WV
Date: 10.22.2013 | Checked | Drawn
Project Number: 613-12-501
Building Number: 320
Drawing Number: 320-MP508
Dwg. 39 of 44

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

BOILER PLANT • FIRE TUBE STEAM BOILER SCHEDULE, PACKAGED TYPE, SHOP ASSEMBLED

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	MAX CAPACITY		BOILER		OPERATING PRESS		HEATING SURFACE		MIN BOILER TURNDOWN	NATURAL GAS				ULTRA LOW SULFUR DIESEL				RELIEF VALVE SETTING		FIRST CUTOUT SETTINGS		SECOND CUTOUT SETTINGS		OIL ATOM COMPRESS MOTOR				AIR COMPRESSOR MOTOR				FAN MOTOR				REMARKS
													INPUT		OUTPUT		INPUT		OUTPUT								POWER		PHASE	VOLT	POWER		PHASE	VOLT	POWER		PHASE	VOLT	
				LBS/HR	[kg/HR]	HP	[kW]	PSIG	[kPa]	SQ FT	[SQ M]	RATIO	MBH	[kW]	MBH	[kW]	MBH	[kW]	MBH	[kW]	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	HP	[W]			HP	[W]			HP	[W]			
320-BFT1	BOILER PLANT	CAMPUS	DRYBACK	24,150	[11000]	700	[520]	105	[720]	3,500	[325]	10:1	28,576	[8400]	23,432	[6900]	28,574	[8400]	23,432	[6900]	135	[930]	110	[760]	125	[860]	1	[750]	3	480	15	[11000]	3	480	60	[45000]	3	480	VFD CONTROL
320-BFT2	BOILER PLANT	CAMPUS	DRYBACK	24,150	[11000]	700	[520]	105	[720]	3,500	[325]	10:1	28,576	[8400]	23,432	[6900]	28,574	[8400]	23,432	[6900]	135	[930]	110	[760]	125	[860]	1	[750]	3	480	15	[11000]	3	480	60	[45000]	3	480	VFD CONTROL
320-BFT3	BOILER PLANT	CAMPUS	DRYBACK	24,150	[11000]	700	[520]	105	[720]	3,500	[325]	10:1	28,577	[8400]	23,433	[6900]	28,575	[8400]	23,433	[6900]	135	[930]	110	[760]	125	[860]	1	[750]	3	480	15	[11000]	3	480	60	[45000]	3	480	VFD CONTROL

NOTES

1. STEAM QUALITY IS 99% MINIMUM.
2. DESIGN PRESSURE IS 200 PSIG [1378 kPa] MINIMUM.
3. FEEDWATER TEMPERATURE IS 212 °F [100 °C] MINIMUM, AND 228 °F [109 °C] NORMAL.
4. THE FUEL TO BE FIRED SHALL BE NATURAL GAS, ULTRA LOW SULFUR DIESEL.
5. ALTITUDE IS 700 FT [213 M] ABOVE SEA LEVEL.
6. THERE SHALL BE 5 PSIG [35 kPa] NATURAL GAS BETWEEN VALVES.

STEAM PRESSURE RELIEF VALVE SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	TEMPERATURE		MINIMUM CAPACITY		SET PRESSURE		REMARKS
			°F	[°C]	LBS/HR	[kg/HR]	PSIG	[kPa]	
320-SV3	BOILER PLANT	DA1/CS1 PRV STATION	250	[120]	9537	[4300]	15	[100]	-
320-SV4	BOILER PLANT	OUTBUILDING PRV STATION	303	[150]	8970	[4100]	55	[380]	-
320-SV5	BOILER PLANT	OUTBUILDING PRV STATION	303	[150]	8970	[4100]	55	[380]	-
320-SV6	BOILER PLANT	INHOUSE PRV STATION	320	[160]	2070	[940]	75	[520]	-
320-SV7	BOILER PLANT	DEAERATOR	240	[120]	7790	[3500]	10	[69]	-
320-SV8	BOILER PLANT	320-FHX1 SAFETY	421	[220]	COORD WITH FHX MANUF.	COORD WITH FHX MANUF.	300	[2100]	-
320-SV9	BOILER PLANT	320-FHX2 SAFETY	421	[220]	COORD WITH FHX MANUF.	COORD WITH FHX MANUF.	300	[2100]	-
320-SV10	BOILER PLANT	320-FHX3 SAFETY	421	[220]	COORD WITH FHX MANUF.	COORD WITH FHX MANUF.	300	[2100]	-

SPLIT SYSTEM AIR CONDITIONER SCHEDULE

MARK INDOOR UNIT	MARK OUTDOOR UNIT	LOCATION	AREA AND/OR BLDG SERVED	TYPE	TOTAL SUPPLY AIR FLOW		MIN. OUTSIDE AIR FLOW		EXT STATIC PRESSURE		COOLING CAPACITY										ELECTRICAL DATA								REMARKS
											MIN TOTAL CAPACITY		MIN SENS CAPACITY		MIN SEER	EAT				OSA DESIGN TEMP		NOMINAL COMP TONS	INDOOR UNIT				OUTDOOR UNIT				
																Db		Wb												
					CFM	[L/s]	CFM	[L/s]	IN	[Pa]	MBH	[kW]	MBH	[kW]		°F	[°C]	°F	[°C]	°F	[°C]		MCA	[W]	PHASE	VOLT	MCA	[W]	PHASE	VOLT	
320-EB1	320-CC1	BOILER PLANT	CONTROL ROOM	DUCTLESS SPLIT	533	[250]	0	[0]	0	[0]	18	[61]	12.7	[4]	19.2	75	[24]	62.5	[17]	95	[35]	1.5	1	[750]	1	208	14	[10000]	1	208	-

BOILER PLANT • CONDENSATE DEAERATOR SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	STORAGE TANK CAPACITY		DIMENSIONS (LENGTH)		DIMENSIONS (DIAMETER)		DEAERATOR CAPACITY		REMARKS
				GAL	[L]	IN	[mm]	IN	[mm]	LBS/HR	[kg/HR]	
320-DA1	BOILER PLANT	BOILERS	1	2000	[7600]	151	[3800]	66	[1700]	48300	[22000]	-

NOTES

1. STORAGE TANK CAPACITY SHALL BE THE VOLUME TO THE OVERFLOW.
2. CONSTRUCTION: ASME CODE FOR 40 PSIG [276 kPa] MINIMUM.

STEAM UNIT HEATER SCHEDULE

MARK	LOCATION	AREA SERVED	TYPE UNIT	AIR FLOW		EAT		MIN CAPACITY		STEAM						TRAP			CONTROL SEQUENCE	MOTOR					REMARKS
										PRESS ENT VALVE		PRESS ENT HEATER		FLOW						NOMINAL POWER		PHASE	VOLT	RPM	
				CFM	[L/s]	°F	[°C]	BTUH	[W]	PSIG	[kPa]	PSIG	[kPa]	LBS/HR	[kg/HR]	MARK	LBS/HR	[kg/HR]		HP	[W]				
320-SUH1	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST15	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH2	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST16	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH3	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST17	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH4	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST18	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH5	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST19	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH6	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST20	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-
320-SUH7	BOILER PLANT	BOILER ROOM	VERTICAL	595	[280]	65	[18]	41300	[12000]	15	[100]	5	[35]	43	[20]	320-ST21	369	[170]	REFER TO SPECIFICATIONS	0.025	[19]	1	120	1550	-

BOILER PLANT • ECONOMIZER SCHEDULE, FLUE GAS/FEEDWATER HEAT EXCHANGERS

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	MIN HEAT EXCHANGED		WATER FLOW		FEEDWATER LEAVING TEMP		MAX PRESS DROP WATER SIDE		MAX PRESS DROP GAS SIDE WC		REMARKS
				MBH	[kW]	GPM	[L/s]	°F	[°C]	PSIG	[kPa]	IN	[Pa]	
320-FHX1	BOILER PLANT	320-BFT1	1	879	[260]	49.8	[3]	264	[129]	0.5	[4]	0.43	[110]	-
320-FHX2	BOILER PLANT	320-BFT2	1	879	[260]	49.8	[3]	264	[129]	0.5	[4]	0.43	[110]	-
320-FHX3	BOILER PLANT	320-BFT3	1	879	[260]	49.8	[3]	264	[129]	0.5	[4]	0.43	[110]	-

NOTES

1. FEEDWATER INLET TEMPERATURE SHALL BE 228 °F [109 °C].
2. MINIMUM HEAT EXCHANGED AT 100% BOILER LOAD.

BOILER PLANT • STEAM FLOWMETER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	METER TYPE	FLUID TYPE	FLUID TEMP		LINE PRESSURE		LINE SIZE		ACCURATE FLOW RANGE		MIN ACCURACY [%]	MAX DIFF PRESS		REMARKS
					°F	[°C]	PSIG	[kPa]	IN	[mm]	LBS/HR	[kg/HR]		PSIG	[kPa]	
320-SFM1	BOILER PLANT	BOILER 320-BFT1	TURBINE	STEAM	341	[172]	105	[720]	8	[200]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM2	BOILER PLANT	BOILER 320-BFT2	TURBINE	STEAM	341	[172]	105	[720]	8	[200]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM3	BOILER PLANT	BOILER 320-BFT3	TURBINE	STEAM	341	[172]	105	[720]	8	[200]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM4	BOILER PLANT	HPS TO OUTBUILDING PRV	TURBINE	STEAM	341	[172]	105	[720]	8	[200]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM5	BOILER PLANT	HPS TO INHOUSE HEADER	TURBINE	STEAM	341	[172]	105	[720]	6	[150]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM6	BOILER PLANT	HPS TO RO PRV	TURBINE	STEAM	341	[172]	105	[720]	2.5	[63]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-
320-SFM7	BOILER PLANT	HPS TO HOSPITAL	TURBINE	STEAM	341	[172]	105	[720]	8	[200]	REFER TO MANUF.	REFER TO MANUF.	+/- 1.5	0.5	[4]	-

STEAM HEATING COIL SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	APPLICATION	AIR FLOW		MAX FACE VELOCITY		APD		TEMPERATURES				TOTAL MIN CAPACITY		STEAM										REMARKS
											EAT		LAT				ENT CONT VALVE		ENT COIL		FLOW		STEAM TRAP				
					CFM	[L/s]	FPM	[M/s]	IN WG	[Pa]	°F	[°C]	°F	[°C]	MBH	[kW]	PSIG	[kPa]	PSIG	[kPa]	LBS/HR	[kg/HR]	MARK	LBS/HR	[kg/HR]	
320-SHC1	BOILER PLANT	BOILER ROOM	COMBUSTION AIR	PREHEAT	5600	[2600]	640	[3.3]	0.232	[58]	0	[-18]	68	[20]	413	[1400]	15	[100]	5	[35]	436	[200]	320-ST22	770	[350]	-
320-SHC2	BOILER PLANT	BOILER ROOM	COMBUSTION AIR	PREHEAT	5600	[2600]	640	[3.3]	0.232	[58]	0	[-18]	68	[20]	413	[1400]	15	[100]	5	[35]	436	[200]	320-ST23	770	[350]	-
320-SHC3	BOILER PLANT	BOILER ROOM	COMBUSTION AIR	PREHEAT	5600	[2600]	640	[3.3]	0.232	[58]	0	[-18]	68	[20]	413	[1400]	15	[100]	5	[35]	436	[200]	320-ST24	770	[350]	-

BOILER PLANT • PUMP SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID									MIN % EFF	ELECTRICAL MOTOR						REMARKS
					FLUID	FLOW		HEAD		NPSH AVAILABLE		TEMPERATURE		SP GR		NOMINAL POWER		PHASE	VOLT	MAX RPM	SPEED CONTROL	
						GPM	[L/s]	FT	[kPa]	FT	[kPa]	°F	[°C]			HP	[kW]					
320-P3	BOILER PLANT	BOILER PLANT	FEEDWATER	MULTI STAGE	CONDENSATE	78	[5]	377	[6000]	6	[96]	228	[109]	1	-	15	[11]	3	480	3600	VFD	-
320-P4	BOILER PLANT	BOILER PLANT	FEEDWATER	MULTI STAGE	CONDENSATE	78	[5]	377	[6000]	6	[96]	228	[109]	1	-	15	[11]	3	480	3600	VFD	-
320-P5	BOILER PLANT	BOILER PLANT	FEEDWATER	MULTI STAGE	CONDENSATE	78	[5]	377	[6000]	6	[96]	228	[109]	1	-	15	[11]	3	480	3600	VFD	-
320-P6	BOILER PLANT	BOILER PLANT	TRANSFER	END SUCT.	CONDENSATE	100	[6]	81	[1300]	6	[96]	210	[99]	1	-	5	[4]	3	480	1750	CONSTANT	-
320-P7	BOILER PLANT	BOILER PLANT	TRANSFER	END SUCT.	CONDENSATE	100	[6]	81	[1300]	6	[96]	210	[99]	1	-	5	[4]	3	480	1750	CONSTANT	-
320-P8	BOILER PLANT	BOILER PLANT	TRANSFER	END SUCT.	CONDENSATE	100	[6]	81	[1300]	6	[96]	210	[99]	1	-	5	[4]	3	480	1750	CONSTANT	-
320-P9	BOILER PLANT	BOILER PLANT	TRANSFER	END SUCT.	CONDENSATE	100	[6]	81	[1300]	6	[96]	210	[99]	1	-	5	[4]	3	480	1750	CONSTANT	-

BOILER PLANT • EMERGENCY GAS SAFETY SHUT-OFF VALVES SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	EV-1 MAIN GAS										EV-2 IGNITER GAS										REMARKS
				FLOW RATE		INLET PRESS		MAX PRESS DROP		MIN DESIGN PRESS		VALVE BODY PIPE SIZE		FLOW RATE		INLET PRESS		MAX PRESS DROP		MIN DESIGN PRESS		VALVE BODY PIPE SIZE		
				CFH	[L/m]	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	IN	[mm]	CFH	L/m	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	IN	[mm]	
320-EGS1	BOILER PLANT	NATURAL GAS & LPG	1	85728	[40000]	5	[35]	0.1	[1]	5	[35]	4	[100]	100	[47]	5	[35]	0.1	[1]	5	[35]	1	[25]	-

NOTES

1. THE MAIN GAS VALVE SHALL HAVE THE SPECIFIC GRAVITY OF NATURAL GAS WITH A FLOW, CFH [CM/s] OF 0.6 TIMES THE MAXIMUM FLOW.
2. THE IGNITER GAS VALVE SHALL HAVE THE SPECIFIC GRAVITY OF PROPANE WITH A FLOW, CFH [CM/s] OF 0.6 TIMES THE MAXIMUM FLOW.

Revisions	Date

CONSULTANTS:

Barton Associates Consulting Engineers
Susquehanna Commerce Center North Building
221 West Philadelphia Street
York, PA 17401
Tel.: (717) 845-7654
Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	RGG	RGG	DJB

DAVID BARTO REGISTERED 19995 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150
T 717.843.3200 F 717.699.0205
York, PA 17404
www.saaarchitects.com

Drawing Title: SCHEDULES - MECHANICAL

Approved Project Director:

Project Title: BOILER PLANT UPGRADE PHASE V

Location: VAMC MARTINSBURG, WV

Date: 10.22.2013 | Checked | Drawn

Project Number: 613-12-501
Building Number: 320
Drawing Number: 320-MP601
Dwg. 40 of 44

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

BOILER PLANT • WATER FLOWMETER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	METER TYPE	FLUID TEMP		LINE PRESSURE		ACCURATE FLOW RANGE		MIN ACCURACY [%]	MAX DIFF PRESS		REMARKS
				°F	[°C]	PSIG	[kPa]	GPM	[L/s]		PSIG	[kPa]	
320-WFM1	BOILER PLANT	CAMPUS CONDENSATE	ULTRASONIC	200	[93]	40	[280]	0 - 125	[0 - 8]	+/- 0.5	0	[0]	-
320-WFM2	BOILER PLANT	320-BFT1 FEEDWATER	ULTRASONIC	264	[129]	155	[1100]	0 - 100	[0 - 6]	+/- 0.5	0	[0]	-
320-WFM3	BOILER PLANT	320-BFT2 FEEDWATER	ULTRASONIC	264	[129]	155	[1100]	0 - 100	[0 - 6]	+/- 0.5	0	[0]	-
320-WFM4	BOILER PLANT	320-BFT3 FEEDWATER	ULTRASONIC	264	[129]	155	[1100]	0 - 100	[0 - 6]	+/- 0.5	0	[0]	-
320-WFM5	BOILER PLANT	RO MAKE-UP TO 320-CS1	ULTRASONIC	200	[93]	50	[350]	0 - 50	[0 - 3]	+/- 0.5	0	[0]	-
320-WFM6	BOILER PLANT	SCW MAKE-UP TO 320-CS1	ULTRASONIC	55	[13]	50	[350]	0 - 100	[0 - 6]	+/- 0.5	0	[0]	-
320-WFM7	BOILER PLANT	SCW MAKE-UP TO 320-DA1	ULTRASONIC	55	[13]	50	[350]	0 - 100	[0 - 6]	+/- 0.5	0	[0]	-

BOILER PLANT · NATURAL GAS FLOWMETER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	LINE PRESSURE		ACCURATE FLOW RANGE		MIN ACCURACY [%]	MAX DIFF PRESS WC		GAS COMPANY BASE PRESS		REMARKS
			PSIG	[kPa]	CFH	[L/m]		IN	[mm]	PSIG	[kPa]	
320-NGFM1	BOILER PLANT	BOILER 320-BFT1 USAGE	REFER TO BOILER PILOT	REFER TO BOILER PILOT	200-38,000	94-18,000	2	7	[10]	5	[35]	GAS METER SHALL BE LOCATED AFTER GAS TRAIN PILOT PRV
320-NGFM2	BOILER PLANT	BOILER 320-BFT2 USAGE	REFER TO BOILER PILOT	REFER TO BOILER PILOT	200-38,000	94-18,000	2	7	[10]	5	[35]	GAS METER SHALL BE LOCATED AFTER GAS TRAIN PILOT PRV
320-NGFM3	BOILER PLANT	BOILER 320-BFT3 USAGE	REFER TO BOILER PILOT	REFER TO BOILER PILOT	200-38,000	94-18,000	2	7	[10]	5	[35]	GAS METER SHALL BE LOCATED AFTER GAS TRAIN PILOT PRV

AIR FILTER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	MERV RATING	AIR FLOW		HOUSING TYPE	CARTRIDGES			ARRANGEMENT	REMARKS
					CFM	[L/s]		#	SIZE IN	SIZE [mm]		
320-PF1	BOILER PLANT	BOILER PLANT COMBUSTION AIR	320-BFT1	8	5600	[2600]	SIDE SERVICE	1	24 x 24 x 2	[600 x600 x 50]	FLAT	-
320-PF2	BOILER PLANT	BOILER PLANT COMBUSTION AIR	320-BFT2	8	5600	[2600]	SIDE SERVICE	1	24 x 24 x 2	[600 x600 x 50]	FLAT	-
320-PF3	BOILER PLANT	BOILER PLANT COMBUSTION AIR	320-BFT3	8	5600	[2600]	SIDE SERVICE	1	24 x 24 x 2	[600 x600 x 50]	FLAT	-

BUILDING • STEAM PRESSURE REDUCING VALVE SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	REQUIRED CAPACITY		MAX FLOW WIDE OPEN VALVE		PRESSURE IN		PRESSURE OUT		REMARKS
				LBS/HR	[kg/HR]	LBS/HR	[kg/HR]	PSIG	[kPa]	PSIG	[kPa]	
320-SPRV5	BOILER PLANT	DA1/CS1 PRV STATION	1	2764	[1300]	3179	[1400]	105	[720]	10	[69]	SHALL BE DDC CONTROL VALVE
320-SPRV6	BOILER PLANT	DA1/CS1 PRV STATION	1	5528	[2500]	6358	[2900]	105	[720]	10	[69]	SHALL BE DDC CONTROL VALVE
320-SPRV7	BOILER PLANT	OUTBUILDING PRV STATION	1	4866	[2200]	6055	[2700]	105	[720]	40	[280]	-
320-SPRV8	BOILER PLANT	OUTBUILDING PRV STATION	1	9734	[4400]	9734	[4400]	105	[720]	40	[280]	-
320-SPRV9	BOILER PLANT	INHOUSE PRV STATION	1	1652	[750]	1815	[820]	105	[720]	15	[100]	-

BOILER PLANT • WATER OUTLET TEMPERATURE CONTROL VALVE SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	MINIMUM FLOW COEFFICIENT [C_V]	FLOW RANGE		MAX INLET PRESS		MAX LEAKAGE AT SHUTOFF	REMARKS
				GPM	[L/s]	PSIG	[kPa]		
320-TCV1	BOILER PLANT	BLOWOFF TANK	16	0 - 30	[0 - 2]	60	[410]	0	-
320-TCV2	BOILER PLANT	CS1 OVERFLOW	16	0 - 30	[0 - 2]	60	[410]	0	-
320-TCV3	BOILER PLANT	BLOWDOWN ECONOMIZER	16	0 - 30	[0 - 2]	60	[410]	0	-

BOILER PLANT • CHEMICAL FEED SYSTEMS, PUMP TYPE SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	FLOW RATE (ADJUSTABLE)		DISCHARGE PRESSURE		PUMP POWER			PUMP TYPE	REMARKS
				GPM	[L/s]	PSIG	[kPa]	[W]	PHASE	VOLTS		
320-CFP1	BOILER PLANT	BOILER 320-BFT1	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY
320-CFP2	BOILER PLANT	BOILER 320-BFT2	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY
320-CFP3	BOILER PLANT	BOILER 320-BFT3	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY
320-CFP4	BOILER PLANT	DEAERATOR 320-DA1	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY
320-CFP5	BOILER PLANT	MAIN HEADER	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY
320-CFP6	BOILER PLANT	RO STORAGE TANK	1	0 - 2	[0 - 1]	150	[1000]	[248]	1	120	METERING	150 GALLON [568 L] TANK CAPACITY

INTAKE HOOD SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	APPLICATION	THROAT SIZE		AIR FLOW		APD		DAMPER TYPE	REMARKS
					IN	[mm]	CFM	[L/s]	IN	[Pa]		
320-IH1	BOILER PLANT	COMBUSTION AIR	INTAKE	DUCTED	42.5 ROUND	[1060]	5600	[2600]	0.082	[21]	MOTOR OPERATED	-
320-IH2	BOILER PLANT	COMBUSTION AIR	INTAKE	DUCTED	42.5 ROUND	[1060]	5600	[2600]	0.082	[21]	MOTOR OPERATED	-
320-IH3	BOILER PLANT	COMBUSTION AIR	INTAKE	DUCTED	42.5 ROUND	[1060]	5600	[2600]	0.082	[21]	MOTOR OPERATED	-

BOILER PLANT • CONDENSATE STORAGE TANK SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	MIN NET CAPACITY		DIMENSIONS (LENGTH)		DIMENSIONS (DIAMETER)		REMARKS
				GAL	[L]	IN	[mm]	IN	[mm]	
320-CS1	BOILER PLANT	BOILERS	1	2000	[7600]	131	[3300]	72	[1800]	-

NOTES

1. MINIMUM NET CAPACITY SHALL BE THE VOLUME TO THE OVERFLOW.
2. CONSTRUCTION: ASME CODE FOR 40 PSIG [276 kPa] MINIMUM.

BOILER PLANT • BLOWOFF TANK SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	MIN NET CAPACITY		DIMENSIONS (LENGTH)		DIMENSIONS (DIAMETER)		REMARKS
				GAL	[L]	IN	[mm]	IN	[mm]	
320-BT1	BOILER PLANT	BOILERS	1	600	[2300]	84	[2100]	54	[1400]	2"[50mm] INLET, 6"[150mm] OUTLET & 6"[150mm] VENT

NOTE

CONSTRUCTION: ASME CODE FOR 40 PSIG [276 kPa] MINIMUM.

BUILDING • STEAM TRAP SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	CAPACITY AT MIN DIFF PRESS		MIN DIFF PRESS		MIN INLET PRESS		TRAP TYPE	TRAP SIZE		REMARKS
			LBS/HR	[kg/HR]	PSI	[kPa]	PSI	[kPa]		IN	[mm]	
320-ST15	BOILER PLANT	SUH1	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST16	BOILER PLANT	SUH2	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST17	BOILER PLANT	SUH3	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST18	BOILER PLANT	SUH4	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST19	BOILER PLANT	SUH5	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST20	BOILER PLANT	SUH6	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST21	BOILER PLANT	SUH7	369	[170]	0.5	[4]	5	[35]	F & T	0.75	[19]	-
320-ST22	BOILER PLANT	SHC1	770	[350]	0.5	[4]	5	[35]	F & T	1.25	[31]	-
320-ST23	BOILER PLANT	SHC2	770	[350]	0.5	[4]	5	[35]	F & T	1.25	[31]	-
320-ST24	BOILER PLANT	SHC3	770	[350]	0.5	[4]	5	[35]	F & T	1.25	[31]	-
320-ST25	BOILER PLANT	DA1 PRV	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST26	BOILER PLANT	DA1 PRV	1000	[450]	5	[35]	10	[69]	F & T	0.75	[19]	-
320-ST27	BOILER PLANT	DA1 PRV	1000	[450]	5	[35]	10	[69]	F & T	0.75	[19]	-
320-ST28	BOILER PLANT	OUTBUILDING PRV	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST29	BOILER PLANT	OUTBUILDING PRV	600	[270]	35	[240]	40	[280]	INVERTED BUCKET	0.75	[19]	-
320-ST30	BOILER PLANT	OUTBUILDING PRV	600	[270]	35	[240]	40	[280]	INVERTED BUCKET	0.75	[19]	-
320-ST31	BOILER PLANT	INHOUSE HEADER	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST32	BOILER PLANT	INHOUSE PRV	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST33	BOILER PLANT	INHOUSE PRV	1075	[490]	10	[69]	15	[100]	F & T	0.75	[19]	-
320-ST34	BOILER PLANT	END LPS MAIN	1075	[490]	10	[69]	15	[100]	F & T	0.75	[19]	-
320-ST35	BOILER PLANT	END LPS MAIN	1075	[490]	10	[69]	15	[100]	F & T	0.75	[19]	-
320-ST36	BOILER PLANT	FIREHOUSE MAIN	705	[320]	35	[240]	40	[280]	INVERTED BUCKET	0.75	[19]	-
320-ST37	BOILER PLANT	FIREHOUSE MAIN	705	[320]	35	[240]	40	[280]	INVERTED BUCKET	0.75	[19]	-
320-ST38	BOILER PLANT	DA1 PRV SEP. DRAIN	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST39	BOILER PLANT	INHOUSE PRV SEP. DRAIN	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-
320-ST40	BOILER PLANT	OUTBUILDING PRV SEP. DRAIN	830	[380]	100	[690]	105	[720]	INVERTED BUCKET	0.75	[19]	-

NOTE

THE CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH AND INSTALL ANY MISCELLANEOUS STEAM TRAPS REQUIRED FOR PROPER PLANT OPERATION EVEN IF NOT INDICATED IN THE SCHEDULE. THIS INCLUDES TRAPS FOR, BUT NOT LIMITED TO, DRIP LEGS, END OF MAINS, ETC FOR CONDENSATE MANAGEMENT.

BOILER PLANT • OIL FLOWMETER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	OIL TYPE #	OIL VISCOSITY RANGE (SSU)	FLUID TEMP		LINE PRESSURE		ACCURATE FLOW RANGE		MIN ACCURACY [%]	MAX DIFF PRESS		REMARKS
					°F	[°C]	PSIG	[kPa]	GPM	[L/s]		PSIG	[kPa]	
320-OFM1	BOILER PLANT	BOILER PLANT FUEL OIL SUPPLY	2	30-200	0 - 100	[-18 - 38]	30	[210]	0 - 30	[0 - 2]	+/- 0.1	0.5	[4]	-
320-OFM2	BOILER PLANT	BOILER PLANT FUEL OIL RETURN	2	30-200	0 - 100	[-18 - 38]	30	[210]	0 - 30	[0 - 2]	+/- 0.1	0.5	[4]	-
320-OFM3	BOILER PLANT	BOILER 320-BFT1 SUPPLY	2	30-200	0 - 100	[-18 - 38]	REFER TO BURNER MANU.	REFER TO BURNER MANU.	0 - 30	[0 - 2]	+/- 0.1	0.5	[4]	-
320-OFM4	BOILER PLANT	BOILER 320-BFT2 SUPPLY	2	30-200	0 - 100	[-18 - 38]	REFER TO BURNER MANU.	REFER TO BURNER MANU.	0 - 30	[0 - 2]	+/- 0.1	0.5	[4]	-
320-OFM5	BOILER PLANT	BOILER 320-BFT3 SUPPLY	2	30-200	0 - 100	[-18 - 38]	REFER TO BURNER MANU.	REFER TO BURNER MANU.	0 - 30	[0 - 2]	+/- 0.1	0.5	[4]	-

BOILER PLANT • BLOWDOWN FLASH ECONOMIZER HEAT EXCHANGER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	QUANTITY	MINIMUM INSIDE TUBES FLOW		SOFTENED WATER TEMPERATURE IN		SOFTENED WATER TEMPERATURE OUT		MINIMUM OUTSIDE TUBES FLOW		BLOWDOWN TEMPERATURE IN		BLOWDOWN TEMPERATURE OUT		REMARKS
				GPM	[L/s]	°F	[°C]	°F	[°C]	GPM	[L/s]	°F	[°C]	°F	[°C]	
320-BHX1	BOILER PLANT	BOILER PLANT	1	60	[3.8]	55	[13]	77	[25]	30	[1.9]	212	[100]	168	[76]	140° F [60° C] MAXIMUM TO SANITARY

NOTE

CONSTRUCTION: ASME CODE FOR 150 PSIG [276 kPa] MINIMUM.

CONDENSATE POLISHER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	INCOMING WATER HARDNESS	FLOW RATE		INLET PRESSURE		BACK WASH FLOW RATE		POLISHER TANK SIZE (DIA x HEIGHT)		BRINE TANK SIZE (DIA x HEIGHT)		SALT CAPACITY OF BRINE TANK	POWER REQUIRED			REMARKS
					PPM	GPM	[L/s]	PSIG	KPA	GPM	[L/s]	IN	[mm]	IN	[mm]	LB	[KG]	AMP	PHASE	VOLT	
316-CDP1	BOILER PLANT	BOILER PLANT	STEAM CONDENSATE	ION EXCHANGE	0.5	100	[6]	35	[240]	20	[1]	30 x 54	[750 x 1400]	24 x 60	[600 x 1500]	650	[300]	15	1	120	DUPLEX SYSTEM

NOTE

CONSTRUCTION: ASME CODE FOR 100 PSIG [690 kPa] MINIMUM.

Revisions	Date

CONSULTANTS:

BartonAssociates, Inc.
Consulting Engineers
Susquehanna Commerce Center
North Building
221 West Philadelphia Street
York, PA 17401
Tel.: (717) 845-7654
Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	RGG	RGG	DJB

DAVID BARTO REGISTERED 19895 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

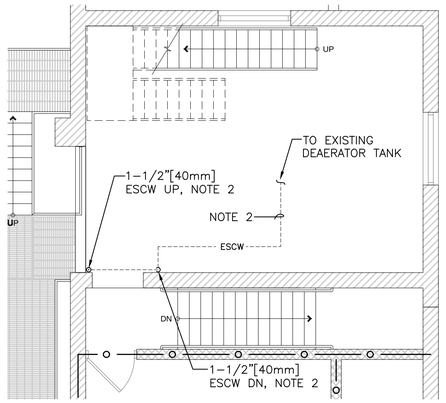
ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150
York, PA 17404
T 717.843.3200 F 717.699.0205
www.saaarchitects.com

Drawing Title: SCHEDULES - MECHANICAL
Approved Project Director:
Project Title: BOILER PLANT UPGRADE PHASE V
Location: VAMC MARTINSBURG, WV
Date: 10.22.2013
Checked:
Drawn:
Project Number: 613-12-501
Building Number: 320
Drawing Number: 320-MP602
Dwg. 41 of 44

Office of Construction and Facilities Management
Department of Veterans Affairs

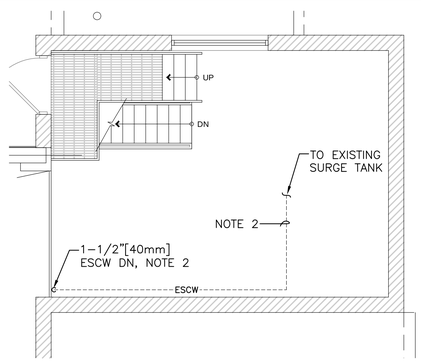
VA FORM 08-6231



N

SECOND FLOOR PLAN – DEMOLITION – PLUMBING

SCALE:1/4"=1'-0" NOTE 1



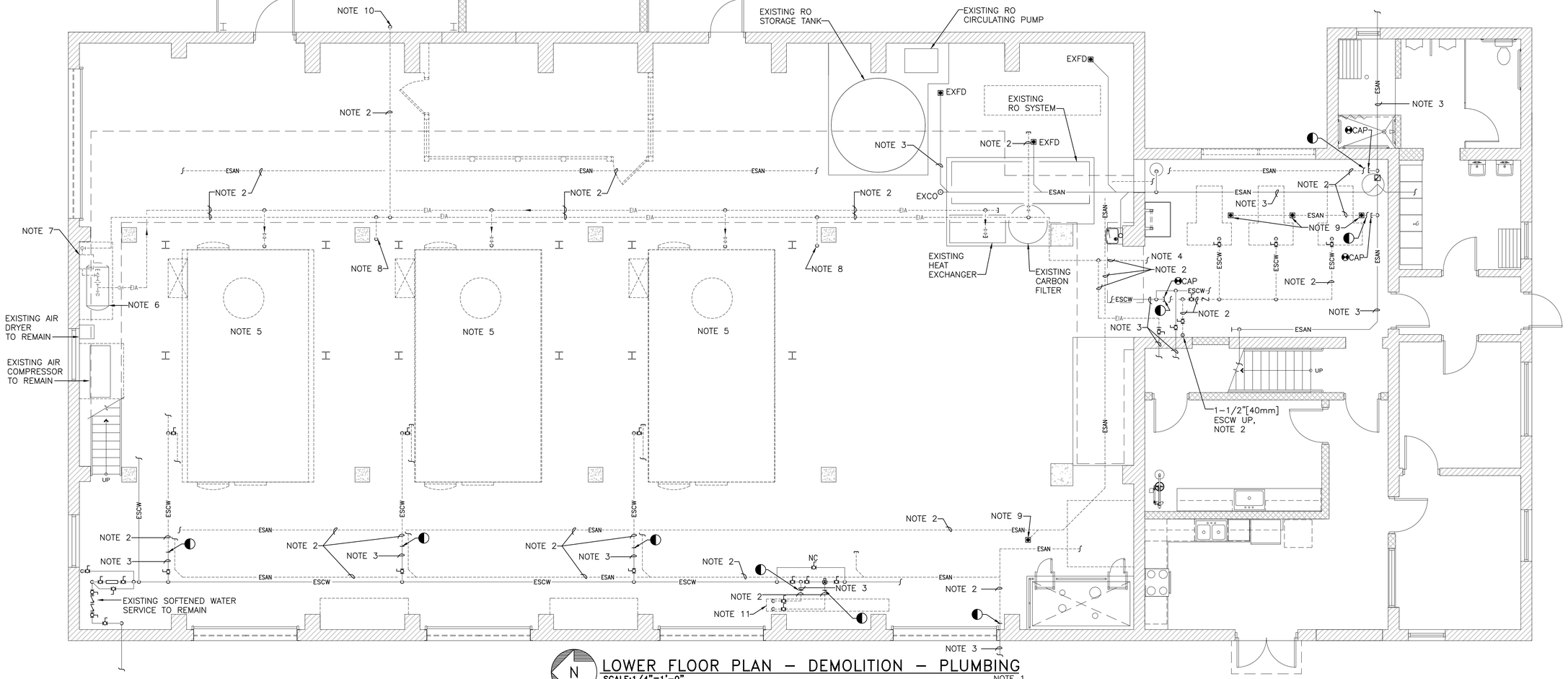
N

THIRD FLOOR PLAN – DEMOLITION – PLUMBING

SCALE:1/4"=1'-0" NOTE 1

NOTES:

1. ALL EXISTING PLUMBING ITEMS SHALL REMAIN UNLESS NOTED OTHERWISE.
2. REMOVE EXISTING PIPING AND APPURTENANCES.
3. EXISTING PIPING SHALL REMAIN.
4. REMOVE ALL INDUSTRIAL AIR PIPING SERVING PNEUMATIC CONTROL SYSTEM IN BOILER PLANT.
5. EXISTING BOILER REMOVED BY HVAC CONTRACTOR. PLUMBING CONTRACTOR SHALL DISCONNECT AND REMOVE ASSOCIATED COLD WATER, DRAIN AND COMPRESSED AIR PIPING AND APPURTENANCES AS INDICATED.
6. REMOVE EXISTING AIR COMPRESSOR, ASSOCIATED PIPING AND APPURTENANCES.
7. REMOVE EXISTING INDUSTRIAL AIR DRYER, ASSOCIATED PIPING AND APPURTENANCES.
8. REMOVE EXISTING HOSE REEL, ASSOCIATED PIPING, AND APPURTENANCES.
9. REMOVE EXISTING FLOOR DRAIN, ASSOCIATED PIPING, AND APPURTENANCES.
10. EXISTING COMPRESSED AIR OUTLET SHALL REMAIN.
11. DISCONNECT AND REMOVE EXISTING SOFTENED COLD WATER PIPING FROM HEAT EXCHANGER AS INDICATED. RELOCATE EXISTING TEMPERATURE SENSORS TO CONNECTIONS AT REPLACEMENT EQUIPMENT. REMOVE EXISTING WATER METER AT HEAT EXCHANGER.



N

LOWER FLOOR PLAN – DEMOLITION – PLUMBING

SCALE:1/4"=1'-0" NOTE 1

Revisions	Date

CONSULTANTS:

Barton Associates. Consulting Engineers
Susquehanna Commerce Center North Building
221 West Philadelphia Street
York, PA 17401
Tel.: (717) 845-7654
Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	EPS	EPS	DJB

DAVID BARTO REGISTERED 19805 PROFESSIONAL ENGINEER WEST VIRGINIA

ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150
T 717.843.3200 F 717.699.0205
York, PA 17404
www.saaarchitects.com

Drawing Title: FLOOR PLANS - DEMOLITION - PLUMBING

Approved: Project Director

Project Title: BOILER PLANT UPGRADE PHASE V

Location: VAMC MARTINSBURG, WV

Date: 10.22.2013 | Checked | Drawn

Project Number: 613-12-501

Building Number: 320

Drawing Number: 320-PD101

Dwg. 22 of 44

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231

PLUMBING ABBREVIATIONS

A/E	ARCHITECT / ENGINEER
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AG	AIR GAP
ASHRAE	AMERICAN SOCIETY HEATING, REFRIGERATION, AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY MECHANICAL ENGINEERS
ASPE	AMERICAN SOCIETY PLUMBING ENGINEERS
BFP	REDUCED PRESSURE BACKFLOW PREVENTER
BHP	BREAK HORSEPOWER
BSP	BLACK STEEL PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
C	CELSIUS
CGA	COMPRESSED GAS ASSOCIATION
CI	CAST IRON
CO	CLEANOUT
CV	CONTROL VALVE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DOE	DEPARTMENT OF ENERGY
DWG	DRAWING
DWV	DRAIN WASTE VENT
EL	ELEVATION
EMCS	ENERGY MONOSERRAT AND CENTRAL SYSTEM
EPA	ENVIROMENTAL PROTECTION AGENCY
EPACT	ENERGY POLICY ACT
ESC	ESCUTCHEON
EX	EXISTING
F	FAHRENHEIT
FD	FLOOR DRAIN
FM	FLOW METER
GAL	GALLON
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GRS	GAS REGULATOR STATION
GVTR	GAS VENT THROUGH ROOF
H&CW	HOT AND COLD WATER
HB	HOSE BIBB
HD	HUB DRAIN
HEX	HEAT EXCHANGER
HP	HORSEPOWER
HYD	HYDRANT
IA	INDUSTRIAL COMPRESSED AIR
INV	INVERT
IPC	INTERNATIONAL PLUMBING CODE
IW	INDIRECT WASTE
KW	KILOWATT
KWHR	KILOWATT-HOUR
L/S	LITER PER SECOND
LBS/HR	POUNDS PER HOUR
M	METER
MAV	MANUAL AIR VENT
MBH	1000 BTUH
NC	NORMALLY CLOSED
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM.	NOMINAL
NTC	NOT TO SCALE
PA	PASCAL
PD	PRESSURE DROP OR DIFFERENCE
PDI	PLUMBING AND DRAINAGE INSTITUTE
PG	PRESSURE GAGE
PP	PLUMBING PUMP
PPM	PARTS PER MILLION
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ATMOSPHERE
PSIG	POUNDS PER SQUARE INCH GAUGE
RO	REVERSE OSMOSIS WATER
SAN	SANITARY SEWER
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SCFM	STANDARD CUBIC FOOT/MINUTE
SCW	SOFTENED COLD WATER
SQFT	SQUARE FEET
SS	STAINLESS STEEL
ST	STORAGE TANK
SW	STORM WATER
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
TYP	TYPICAL
V	VENT
VB	VACUUM BREAKER
VS	VENT STACK
VTR	VENT THROUGH ROOF
W	WASTE
WG	WATER GAGE
WH	WALL HYDRANT
WM	WATER METER
WPD	WATER PRESSURE DROP

DRAWING SYMBOLS

- 2 / PL105 — DETAIL NUMBER; DRAWING NUMBER WHERE DRAWN
- A / PL105 — SECTION LETTER; DRAWING NUMBER WHERE SHOWN
- 26–P 3 — BUILDING NO. WHERE EQUIPMENT IS LOCATED; EQUIPMENT ABBREVIATION (PUMP); PUMP NO.3 IN BUILDING NO.26; TYPICAL UNIT NO.

PLUMBING PIPING SYMBOLS

- DOMESTIC COLD WATER, COLD WATER
- DOMESTIC HOT WATER, HOT WATER
- DOMESTIC HOW WATER RETURN, HOT WATER RETURN
- IA — INDUSTRIAL AIR
- D — DRAIN
- SAN — SANITARY SEWER
- SS — SANITARY SEWER (OPTIONAL)
- SAN — SANITARY SEWER, BELOW GRADE
- SCW — SOFTENED COLD WATER

GENERAL PLUMBING SYMBOLS

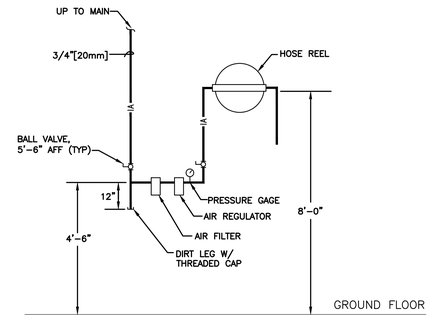
- DIRECTION OF PIPE PITCH (DOWN)
- DIRECTION OF FLOW
- ANCHOR
- REDUCER OR INCREASER
- ECCENTRIC REDUCER
- TOP CONNECTION, 45° OR 90°
- BOTTOM CONNECTION, 45° OR 90°
- SIDE CONNECTION
- CAPPED OUTLET
- RISE OR DROP IN PIPE
- UNION
- PIPE UP
- PIPE DOWN
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- LIMIT OF DEMOLITION
- STRAINER
- THERMOMETER
- PRESSURE GAGE
- CLEAN OUT
- HOSE BIB

PLUMBING VALVE SYMBOLS

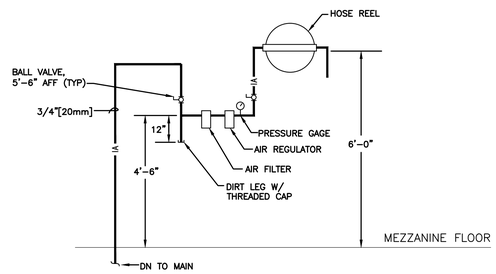
- GATE VALVE
- GLOBE VALVE
- GATE VALVE WITH 3/4 " HOSE ADAPTER
- CHECK VALVE
- BUTTERFLY VALVE
- BALL VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- MANUAL AIR VENT
- TEST PLUG (PRESSURE/TEMPERATURE)
- AUTOMATIC AIR VENT

PACKAGE BOOSTER PUMP SCHEDULE

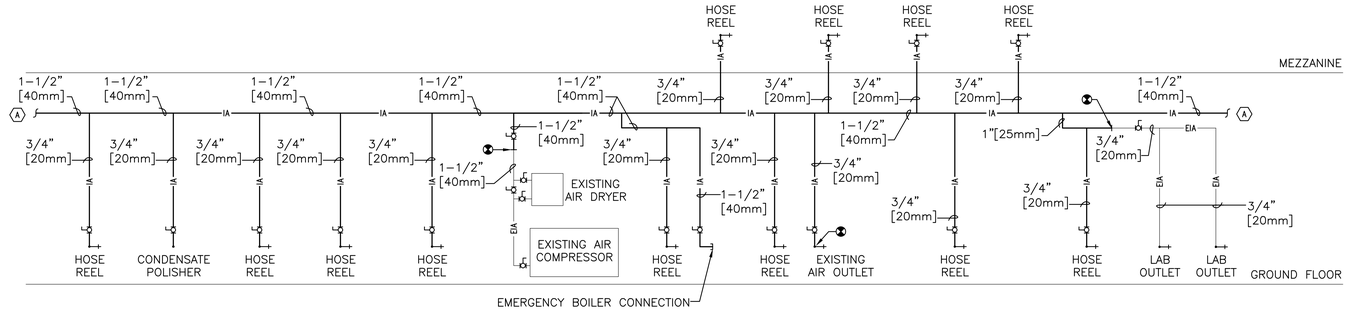
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID: FLUID	NO. PUMPS	FLOW EA. PUMP: GPM	FLOW EA. PUMP: [L/s]	HEAD EA. PUMP: FT	HEAD EA. PUMP: [M]	MIN NPSH AVAIL	TEMPERATURE: °F	TEMPERATURE: [°C]	SP GR	% EFF	PRESSURE TRANSMITTER SETPOINT: PSIG	PRESSURE TRANSMITTER SETPOINT: [kPa]	OULET BUFFER TANK ACCEPTANCE VOLUME: GAL	OULET BUFFER TANK ACCEPTANCE VOLUME: [L]	ELECTRICAL MOTOR: NOMINAL POWER, EA. HP	ELECTRICAL MOTOR: NOMINAL POWER, EA. [kW]	ELECTRICAL MOTOR: PHASE	ELECTRICAL MOTOR: VOLT	ELECTRICAL MOTOR: MAX RPM	ELECTRICAL MOTOR: SPEED CONTROL	REMARKS
320-BP1	SHED 112	BOILER PLANT	DOMESTIC BOOSTER PUMP	VERTICAL MULTISTAGE	DOMESTIC COLD WATER	2	100	[6]	180	[54]	16	50	[10]	1	60	85	[590]	53	[200]	7.5	[6]	3	460	3500	VARIABLE	-----



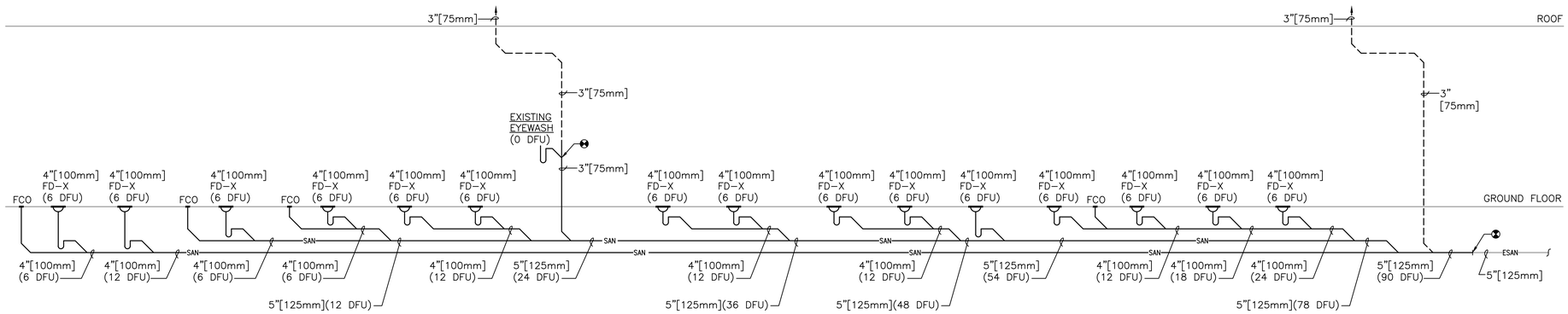
1 HOSE REEL - MAIN FLOOR LEVEL
NTS



2 HOSE REEL - MEZZANINE FLOOR LEVEL
NTS



COMPRESSED AIR RISER DIAGRAM #1
NO SCALE



SANITARY & VENT RISER DIAGRAM #1
NO SCALE

Revisions:	Date

CONSULTANTS:

Barton Associates. Consulting Engineers
Susquehanna Commerce Center North Building
221 West Philadelphia Street
York, PA 17401
Tel.: (717) 845-7654
Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
20111.30.02	EPS	EPS	DJB

DAVID BARTO REGISTERED 19905 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150
T 717.843.3200
York, PA 17404
F 717.699.0205
www.saaarchitects.com

Drawing Title: DETAILS AND SCHEDULES

Approved: Project Director

Project Title: BOILER PLANT UPGRADE PHASE V

Location: VAMC MARTINSBURG, WV

Date: 10.22.2013 | Checked | Drawn

Project Number: 613-12-501

Building Number: 320

Drawing Number: 320-PL001

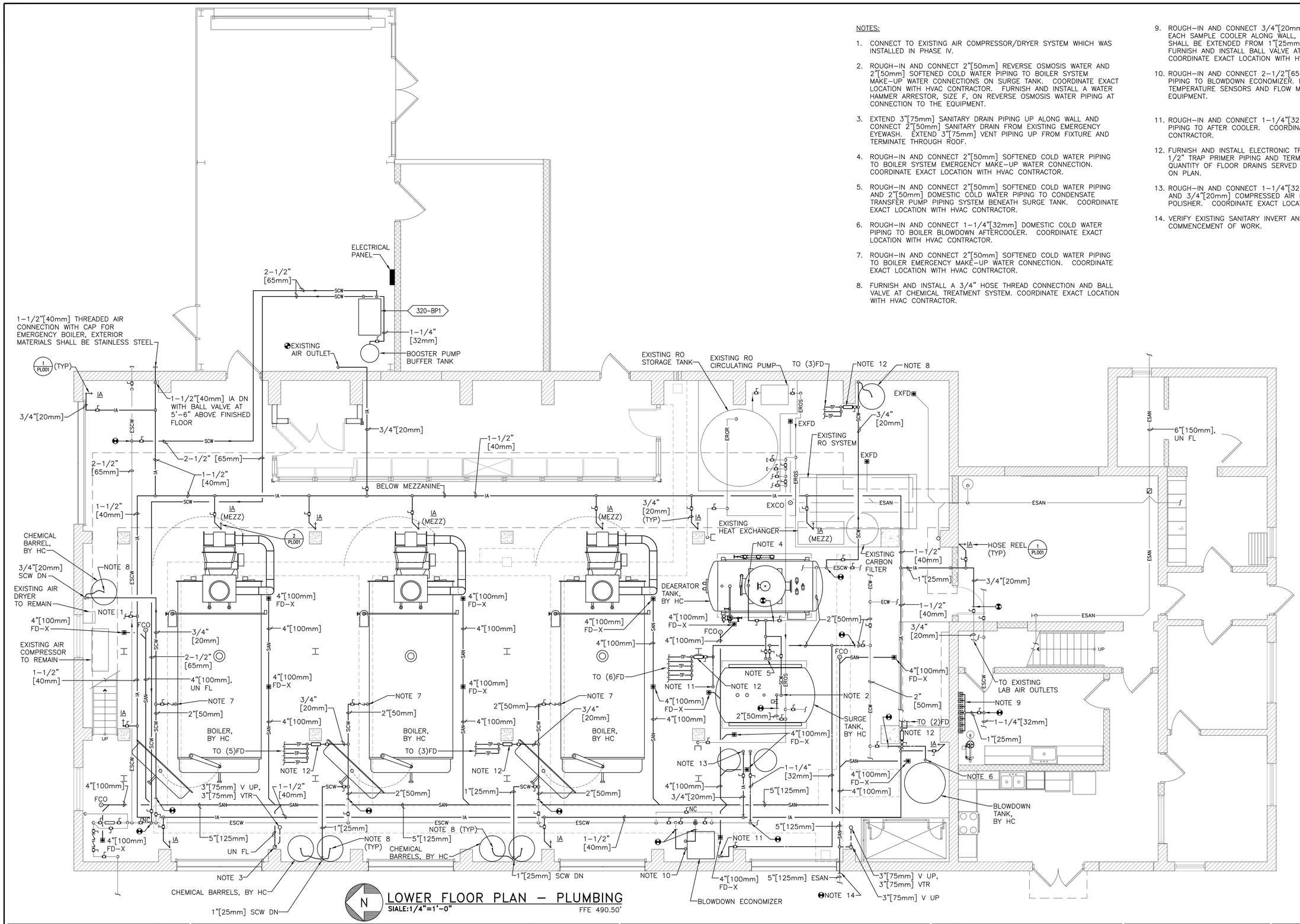
Dwg. 21 of 44

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

NOTES:

1. CONNECT TO EXISTING AIR COMPRESSOR/DRYER SYSTEM WHICH WAS INSTALLED IN PHASE IV.
2. ROUGH-IN AND CONNECT 2"[50mm] REVERSE OSMOSIS WATER AND 2"[50mm] SOFTENED COLD WATER PIPING TO BOILER SYSTEM MAKE-UP WATER CONNECTIONS ON SURGE TANK. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR. FURNISH AND INSTALL A WATER HAMMER ARRESTOR, SIZE F, ON REVERSE OSMOSIS WATER PIPING AT CONNECTION TO THE EQUIPMENT.
3. EXTEND 3"[75mm] SANITARY DRAIN PIPING UP ALONG WALL AND CONNECT 2"[50mm] SANITARY DRAIN FROM EXISTING EMERGENCY EYEWASH. EXTEND 3"[75mm] VENT PIPING UP FROM FIXTURE AND TERMINATE THROUGH ROOF.
4. ROUGH-IN AND CONNECT 2"[50mm] SOFTENED COLD WATER PIPING TO BOILER SYSTEM EMERGENCY MAKE-UP WATER CONNECTION. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
5. ROUGH-IN AND CONNECT 2"[50mm] SOFTENED COLD WATER PIPING AND 2"[50mm] DOMESTIC COLD WATER PIPING TO CONDENSATE TRANSFER PUMP PIPING SYSTEM BENEATH SURGE TANK. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
6. ROUGH-IN AND CONNECT 1-1/4"[32mm] DOMESTIC COLD WATER PIPING TO BOILER BLOWDOWN AFTERCOOLER. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
7. ROUGH-IN AND CONNECT 2"[50mm] SOFTENED COLD WATER PIPING TO BOILER EMERGENCY MAKE-UP WATER CONNECTION. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
8. FURNISH AND INSTALL A 3/4" HOSE THREAD CONNECTION AND BALL VALVE AT CHEMICAL TREATMENT SYSTEM. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
9. ROUGH-IN AND CONNECT 3/4"[20mm] SOFTENED COLD WATER TO EACH SAMPLE COOLER ALONG WALL, TYPICAL FOR SEVEN. PIPING SHALL BE EXTENDED FROM 1"[25mm] HEADER ALONG WALL. FURNISH AND INSTALL BALL VALVE AT EACH CONNECTION. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
10. ROUGH-IN AND CONNECT 2-1/2"[65mm] SOFTENED COLD WATER PIPING TO BLOWDOWN ECONOMIZER. INSTALL RELOCATED TEMPERATURE SENSORS AND FLOW METER AT CONNECTION TO EQUIPMENT.
11. ROUGH-IN AND CONNECT 1-1/4"[32mm] DOMESTIC COLD WATER PIPING TO AFTER COOLER. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
12. FURNISH AND INSTALL ELECTRONIC TRAP PRIMING DEVICE. EXTEND 1/2" TRAP PRIMER PIPING AND TERMINATE AT FLOOR DRAIN(S). QUANTITY OF FLOOR DRAINS SERVED BY TRAP PRIMER IS INDICATED ON PLAN.
13. ROUGH-IN AND CONNECT 1-1/4"[32mm] SOFTENED COLD WATER AND 3/4"[20mm] COMPRESSED AIR PIPING TO CONDENSATE POLISHER. COORDINATE EXACT LOCATION WITH HVAC CONTRACTOR.
14. VERIFY EXISTING SANITARY INVERT AND LOCATION PRIOR TO COMMENCEMENT OF WORK.



N

LOWER FLOOR PLAN - PLUMBING

SIALE:1/4"=1'-0"

FFE 490.50'

VA FORM 08-6231

Revisions:	Date

CONSULTANTS:

Barton Associates. Consulting Engineers
Susquehanna Commerce Center North Building
221 West Philadelphia Street
York, PA 17401
Tel.: (717) 845-7654
Web: www.ba-inc.com
We Make Buildings Work.
YORK | STATE COLLEGE

PROJECT No.	DRAWN BY:	DESIGNED BY:	CHECKED BY:
2011130.02	EPS	EPS	DJB

DAVID BARTO REGISTERED 19805 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

ARCHITECT/ENGINEERS:

SAA architects
600 North Hartley Street, Suite 150
T 717.843.3200 F 717.699.0205
York, PA 17404
www.saaarchitects.com

Drawing Title	LOWER FLOOR PLAN - PLUMBING
Approved: Project Director	
Project Title	BOILER PLANT UPGRADE PHASE V
Project Number	613-12-501
Building Number	320
Location	VAMC MARTINSBURG, WV
Drawing Number	320-PL101
Date	10.22.2013
Checked	
Drawn	

Office of Construction and Facilities Management
Department of Veterans Affairs